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10/575,578	04/11/2006	Michiel Adriaanszoon Klompenhouwer	US030436	9557
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/575,578	KLOMPENHOUWER ET AL.
	Examiner	Art Unit
	Edward Martello	2628

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 11 April 2006.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-23 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-23 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 11 April 2006 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date 04/11/2006.

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
 5) Notice of Informal Patent Application
 6) Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Color Gamut Mapping and Brightness Enhancement for Mobile Displays. Paragraph [0007] of the instant application inspired this suggested title.

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claims 21-23 specify a "computer readable medium" which has no support in the specification and if interrupted broadly, could include non statutory matter.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 8 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The terms "optionally" and "if needed" in claim 8 are indefinite terms which render the action of the claim indefinite. The conditions under which the terms "optionally" and "if needed" should result in invoking the stated action of the claim are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree of assessing some triggering condition(s), and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention in applying the stated action.

4. Claims 9-11 are rejected as being dependent upon a claim which is rejected under 35 U.S.C. 112, second paragraph and as such they are indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claims 14, 16, 19 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "optionally" in these claims is an indefinite term which renders the action of the claim indefinite. The conditions under which the term "optionally" should result in invoking the stated action of the claim is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree of assessing some triggering condition(s), and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention in applying the stated action.

6. Claims 17, 20 and 22 are rejected as being dependent upon a claim which is rejected under 35 U.S.C. 112, second paragraph and as such they are indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 21-23 are rejected under 35 U.S.C. 101 as the claimed invention is directed to non-statutory subject matter. The claims recite "computer readable medium" which has no definition in the specification, and when interrupted broadly, could include non statutory matter such as programs, paper listings of code, signals and other non statutory matter.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyachi et al. (U. S. Patent Application Publication 2003/0043165 A1, hereafter '165).

9. Regarding claim 1, Miyachi teaches a method for correcting a color image, the method comprising the steps of: correcting the gamut of the color image (adjust a color reproduction range; i.e. gamut; '165; ¶ 0004); and smart clipping the corrected image by "adding white" to out-of-gamut digital data of the color image ('165; ¶ 0071). Miyachi's adding white is the set of equations at the bottom of paragraph [0071] where selecting each color signal in turn adds in a proportional amount of the remaining two color signals which is equivalent to adding white. It would have been obvious to one of ordinary skill in the art at the time of the invention to use Miyachi's "adding white" to remove this constant term from the input to allow proportional scaling of the colors in further processing.

10. In regard to claim 2, Miyachi further teaches wherein the smart clipping step of "adding of white" further comprises the step of scaling with the brightness of digital data having dark digital data get less white added than bright digital data ('165; ¶ 0071 – equations at the end of the paragraph show that each signal is scaled proportionally to the intensity of the signal resulting in the lower valued signals (i.e. darker) receiving less added white).

11. Regarding claim 3, Miyachi further teaches further comprising the step of reducing overall brightness of the color image ('165; ¶ 0083-0085). Each color signal is scaled by a multiplier that varies from 0 to user or designer set maximum thus reducing the overall brightness of the color image.

12. In regard to claim 4, Miyachi further teaches wherein said reducing step further comprises the step of multiplying digital image data of the color image by a fixed value but does not teach a specific value of 0.85. Miyachi, however, does teach multiplying the input color values by constants that vary up to a value of 2 and suggests a value of 0.5 ('165; ¶ 0073). It would have been obvious to one of ordinary skill in the art at the time of the invention to have made the design choice of selecting 0.85 as a scale factor after evaluating a number of images on a targeted display just as was done in the instant application at paragraph [0037].

13. Regarding claim 5, Miyachi further teaches wherein said reducing step further comprises the step of determining the reduction as a function of an input gamut and a display gamut ('165; Abstract; ¶ 0001; ¶ 0027).

14. In regard to claim 6, Miyachi further teaches wherein said reducing step further comprises the step of determining the reduction as a function of a saturation of the incoming signal ('165; ¶ 0025).

15. Regarding claim 7, Miyachi further teaches wherein said function is 0 when the saturation is equal to 0, maximal when the saturation is greater than some value less than maximum but does not explicitly teach the exact value of 0.750, and teaches that it is equal to a monotonically increasing function as a function of the saturation when the saturation is in the range between 0 and some value less than maximum but does not explicitly teach the exact value of 0.75 ('165, ¶ 0084-0090). Miyachi teaches limiting the maximum to less than one but leaves the design choice to the equipment designer. It would have been obvious to one of ordinary skill in the art at the time of the invention to choose a value such as 0.75 after evaluating a number of images on a targeted display.

16. In regard to claim 8, Miyachi further comprising the steps of: optionally performing a gamma correction on the digital image data before the step of correcting the gamut; and if needed, performing an inverse gamma correction on the smart clipped image ('165; ¶ 0262-0263).

17. Regarding claim 9, Miyachi further teaches the method as further comprising the step of reducing the overall brightness of the color image ('165; 0269-0271 - equations these paragraphs show that each signal is scaled proportionally to the intensity of the signal resulting in the lower valued signals (i.e. darker) receiving less added white).

18. In regard to claim 10, Miyachi further teaches wherein said reducing step further comprises the step of determining the reduction as a function of a saturation of the incoming signal ('165; ¶ 0261-0263).

19. Regarding claim 11, Miyachi further teaches wherein said function is 0 when the saturation is equal to 0, maximal when the saturation greater than some value less than one but

does not explicitly teach the exact value of 0.75, and equal to a monotonically increasing function as a function of the saturation when the saturation is in the range between 0 and some value less than maximum but does not explicitly teach the exact value of 0.75. It would have been obvious to one of ordinary skill in the art at the time of the invention to choose a value such as 0.75 after evaluating a number of images on a targeted display.

20. In regard to claim 12, Miyachi teaches an apparatus (device) for primary color correction and clipping, comprising: a means for receiving digital data of a color image having a source gamut; a display having a display gamut ('165; fig. 2); one of a program memory storing and a calculation logic device providing (signal processing means) - (i) a plurality of algorithms, that includes smart clipping algorithms (adjust a color reproduction range; i.e. gamut; '165; ¶ 0004), for mapping the source gamut to the display gamut, and (ii) a multi-step 'smart' clipper module that executes the plurality of algorithms for mapping the source gamut to the display gamut ('165; ¶ 0071; ¶ 0083-0085; ¶ 0261-0263); and a controller/processing unit configured to - control receipt of the digital data, execute the 'smart' clipper module to accomplish mapping the source gamut to the display gamut for the received digital data, and output the mapped digital data to the display ('165; fig. 2).

21. Regarding claim 13, Miyachi further teaches further comprising a storage device for storing received digital data and output digital data of a color image ('165; ¶0069-0071).

22. In regard to claim 14 Miyachi further teaches wherein the plurality of algorithms comprises: optionally executable gamma correction algorithms ('165; ¶ 0262-0263); gamut mapping algorithms to reduce brightness of digital data of a color image ('165; 0269-0271); smart clipping algorithms to correct digital data of a color image by "adding white" to out-of-

gamut digital data of the color image ('165; ¶ 0071); and saturation dependent attenuation algorithms ('165; ¶ 0261-0263). Miyachi's adding white is the set of equations at the bottom of paragraph [0071] where selecting each color signal in turn adds in a proportional amount of the remaining two color signals which is equivalent to adding white. It would have been obvious to one of ordinary skill in the art at the time of the invention to use Miyachi's "adding white" to remove this constant term from the input to allow proportional scaling of the colors in further processing.

23. Regarding claim 15, Miyachi further teaches wherein the smart clipping algorithms further comprise magnifying the clipping effect based on intensity of digital data of the color image ('165; ¶ 0071 – equations at the end of the paragraph show that each signal is scaled proportionally to the intensity of the signal resulting in the lower valued signals (i.e. darker) receiving less added white).

24. In regard to claim 16, Miyachi further teaches wherein the plurality of algorithms comprises: optionally executable gamma correction algorithms ('165; ¶ 0262-0263); gamut mapping algorithms to reduce brightness of digital data of a color image ('165; ¶ 0083-0085); smart clipping algorithms to correct digital data of a color image by "adding white" to out-of-gamut digital data of the color image ('165; ¶ 0071); and saturation dependent attenuation algorithms ('165; ¶ 0025).

25. Regarding claim 17, Miyachi further teaches wherein the smart clipping algorithms further comprise magnifying the clipping effect based on intensity of digital data of the color image ('165; ¶ 0071-0072).

26. In regard to claim 18, Miyachi teaches a 'smart' clipper apparatus for primary color correction and clipping, comprising: a plurality of algorithms ('165; ¶ 0071; ¶ 0083-0085; ¶ 0261-0263), that includes smart clipping algorithms, for mapping a source gamut to a display gamut, and a multi-step 'smart' clipper module that executes said plurality of algorithms ('165; ¶ 0071; ¶ 0083-0085; ¶ 0261-0263).

27. Regarding claim 19, Miyachi further teaches wherein the plurality of algorithms comprises: optionally executable gamma correction algorithms ('165; ¶ 0262-0263); gamut mapping algorithms to reduce brightness of digital data of a color image ('165; 0269-0271); smart clipping algorithms to correct digital data of a color image by "adding white" to out-of-gamut digital data of the color image ('165; ¶ 0071); and saturation dependent attenuation algorithms ('165; ¶ 0025).

28. In regard to claim 20, Miyachi further teaches wherein the smart clipping algorithms further comprise magnifying the clipping effect based on intensity of digital data of the color image ('165; ¶ 0071 – equations at the end of the paragraph show that each signal is scaled proportionally to the intensity of the signal resulting in the lower valued signals (i.e. darker) receiving less added white).

29. Regarding claim 21, Miyachi teaches a computer readable medium, comprising computer instructions for: a plurality of algorithms, that includes smart clipping algorithms, for mapping a source gamut to a display gamut, and a multi-step 'smart' clipper module that executes said plurality of algorithms ('165; ¶ 0071; ¶ 0083-0085; ¶ 0261-0263).

30. In regard to claim 22, Miyachi further teaches, wherein said plurality of algorithms further comprises computer instructions for: optionally executable gamma correction algorithms

(‘165; ¶ 0262-0263); gamut mapping algorithms to reduce brightness of digital data of a color image (‘165; 0269-0271); smart clipping algorithms to correct digital data of a color image by "adding white" to out-of-gamut digital data of the color image (‘165; ¶ 0071); and saturation dependent attenuation algorithms (‘165; ¶ 0025).

31. Regarding claim 23, Miyachi further teaches wherein the smart clipping algorithms further comprise magnifying the clipping effect based on intensity of digital data of the color image ('165; ¶ 0071 – equations at the end of the paragraph show that each signal is scaled proportionally to the intensity of the signal resulting in the lower valued signals (i.e. darker) receiving less added white).

Conclusion

The following prior art, made of record, was not relied upon but is considered pertinent to applicant's disclosure:

US 20050248551 A1	Non-linear picture processing
US 20040263456 A1	Color display device, color compensation method, color compensation program, and storage medium readable by computer
US 6411304 B1	Color data gamut conversion using three color lightness ranges in an apparatus, method, and computer-readable recording medium with a program making a computer execute the method recorded therein
US 6078686 A	Image quality enhancement circuit and method therefor
US 5774112 A	Method and apparatus for tone correction of a digital color image with preservation of the chromaticity of the image
US 5619280 A	Color conversion apparatus that restricts the color reproduction range of primary color signals
US 5355225 A	Video signal color correction with dual function memories and color window

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edward Martello whose telephone number is (571) 270-1883. The examiner can normally be reached on M-F 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Xiao Wu can be reached on (571) 272-7761. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/EM/

Examiner, Art Unit 2628

/XIAO M. WU/
Supervisory Patent Examiner, Art Unit 2628